

## **ABSTRACT OF THE DISCLOSURE**

A thulium-doped fiber amplifier is disclosed and includes a thulium-doped fiber to amplify optical signals belonging to S-band, a first pumping unit to output amplified  
5 spontaneous emission that represents a peak value in a predetermined wavelength range belonging to C-band, to pump the thulium-doped fiber, and a second pumping unit to output pumping light belonging to the C-band and a different wavelength band to pump the thulium-doped fiber.